ARE WE REALLY TRAINING OUR GRADUATE STUDENTS TO BE RESEARCHERS?

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Most of us at one time or another are tempted into the role of amateur clinical psychologist to the purpose of dissecting the behavioral vagaries of our acquaintances. Succumbing to this temptation today, I would like to dwell on the symptoms of a strange syndrome that appears to affect individuals at the dissertation stage of graduate training in our field. This pathological condition can be divided into three stages: pre-dissertation depression, dissertation hysteria, and post-dissertation research avoidance.

Among symptoms of the first stage are a slack jaw, vacant stare, impairment in logical thinking and impairment in the decision-making processes. If the student becomes fixated at this first stage, he is unable to define a dissertation project and progresses no further. If a project is defined, the student is precipitated into the second stage which is symptomized by wild, often red-rimmed eyes, a generally unkempt appearance, frenetic behavior, and alarming tendencies toward long distance telephone calls and toward gulping martinis without chewing the olive. Completion of the dissertation leads to the final stage, post-dissertation research avoidance, which can be chronic. However, in the course of normal events, some de-sensitivation may occur and the subject becomes able to assert that research is good, should be applied by all, but in no way is able ever to undertake any research or apply any on his own. No known therapy has been demonstrated capable of alleviating these conditions. That being the case, our only hope may be in preventive medicine and this is my concern here today.

It is my serious contention that plunging a graduate student into research for the first time at the dissertation level is sufficiently traumatic to cause many to reject research as a serious activity thereafter. Consequently, I identify, as a serious deficit in graduate training in our field, the lack of opportunity for active research involvement and experience prior to the dissertation. Provision for and emphasis upon research involvement early in graduate training is the preventive medicine hopefully mentioned before. No graduate student in vision should reach the dissertation stage without actual prior research experience. Talking about research in statistics and design courses or in research seminars simply fails to provide the kinds and depth of experience that enable a student to come effectively to grips with a research problem in a realistic way.

Traditionally in graduate programs, early research experience was available to students through participation in faculty conducted research. Such opportunities have been minimal in our field. It is, of course, obvious to us all that the compelling and immediate need to build, staff, and conduct graduate programs has sapped the energies that might have been directed to faculty research. But I suspect that experiences along the line I have facetiously described have also played a significant part in contributing to lack of faculty research in our graduate programs. The extent of this deficit is implied in some data recently published by Switzer & Bledsoe (1970) which described research support in the area of the visually impaired by government agencies during the years 1954-1970. During this period the federal government funded 249 research or demonstration projects, 104 of which concerned topics that were of the type to have been carried out in our graduate programs. However, only 17 of these grants were made to our programs. If we consider that 32 visually handicapped teacher training

programs were recently listed in The Fountainhead and that the report covered a period of 16 years, we can only conclude that research conducted by faculty within our programs has been meagre indeed. Perhaps now that the number of persons trained to the doctorate is increasing, the faculties in our graduate programs can be augmented and time freed for faculty research. This could solve our problem. However, if the past is any basis on which to predict the future, the quantity of research that may ensue may yet be insufficient to meet the need. Consequently, we need to look at alternatives.

One alternate that has occurred to me may be possible within present programs. That is the simulation of research. In general, research consists of the phases of problem identification, research design, materials design and preparation, sample selection, data collection, data analysis, and report writing. Each phase consists of the activities of problem analysis, decision making, and decision execution with the latter activity uncovering a new problem or array of problems to be analyzed for the next phase. I believe it quite possible that one might choose several research studies from the literature (or invent these) and program them in such a way as to require the student to undertake most of the phases and activities of research. Among possible exceptions might be actual preparations of materials and data collection. This idea is well worth consideration and, in and of itself, constitutes a research and development project of considerable intrinsic interest.

A second alternate solution is to send students for internship periods to places where research is already in progress. Future possibilities for research internships might include The Sensory Aids Evaluation & Development Center, MIT, the Perceptual Alternatives Laboratories, University of Louisville; American Center for Research in Blindness and Rehabilitation, Boston; Stanford

Research Institute, Palo Alto; and the Cybernetics Research Institute, Washington, D. C. The only current research internship program of which I am aware is that occurring within our Educational Research, Development, and Reference Group at the American Printing House. I would like to describe this to you as an example.

Most of you here are familiar with our research program. Started in 1952 it is longitudinal and programmatic in nature. We try to define capabilities of visually impaired children with emphasis on their perceptual problems, identify the educational tasks with which they have difficulty, and then develop prescriptive materials that will enable them to overcome the difficulty. Our present research includes such things as materials development in the areas of elementary mathematics, science and social studies; curriculum development in the readiness and primary reading areas; research on braille codes, study of listening as a substitute for reading in learning, and basic research in tactile perception. Present staff numbers thirteen.

Flexibility is the earmark of our internship program. The only restrictions are that the intern have a relevant bachelors degree and be willing to work in our broad areas of interest. The term of service can be three months or more and start at almost any point of the year. While many interns are supported in part by fellowships at their schools, other arrangements for financial support are possible. If the intern desires and his school concurs, graduate theses can be completed during the internship period. Depending upon circumstances, the program can be varied from where the intern acts as a research assistant, participating in appropriate phases of a variety of research projects, to where the intern is primarily responsible for a research project of his own. Since execution of research requires travel, the intern has an opportunity for contact with a variety of

educational settings throughout the United States.

It might be of interest to enumerate some of the specific ways in which an internship can add to the research background the student achieves in the classroom. Broad range of experience in many research areas is particularly valuable in pointing up the many practical problems of research. The need for relevance of research is to contribute to solution of present day problems can be emphasized. The necessity for programmatic research can be stressed and the student can participate in the process of identifying a research problem, analyzing it into its constituent parts, and developing strategies for its solution.

Many of the pragmatic factors in research are revealed to the student for the first time. These include the continuing struggle to avoid compromise of the ideal in research design and sampling; the diplomacy of obtaining subjects and the etiquette of conducting research in the schools; the logistics of research to include the trade off between certain types of sampling and costs; the necessity for maintenance of strict standards of quality control, with checking procedures built in with planning throughout a project, the necessity to interrelate the sequences of research with its parallel activities along a time line, and finally students often have opportunity to gain experience in the gentle art of proposal writing.

Much of the difficulty for faculty and students in conducting research seems to lie in the selection of a problem or area that can be realistically attacked. The idea that each piece of research should make some significant contribution to our field is valid. However, sometimes people equate significance with extent, ignoring the fact that significant contributions can be quite small or narrow in application. It might be well to evaluate this idea in terms of some of the research needs of our field. These range from research on very basic questions to research or questions that are quite

applied in nature. They also range from problems that are very broad in nature to problems that are narrow and from problems that are quite relevant to the experience of our students to problems that are quite distant.

Basic research on broad problems of low relevance to experience in our field is exemplified by needs in the area of cognitive development some of which are described on list one. These problems need attack on a programmatic basis and require extensive psychological background. However, participation by persons in our field might be possible if this occurred within the context of an outside programmatic effort.

Research needs in the area of braille reading, some of which are contained in list two, illustrate the task of finding a realistic research problem from a slightly different angle. Here is an area where both realistic and unrealistic research problems may be found. Items listed under Reading Readiness present the most relevant and easily managed problems for which solutions would constitute significant but narrow contributions.

Still another way of finding realistic problems is illustrated in list three. These items represent topics whose teaching in junior high science books leans heavily on pictorial presentation or demonstrations and experiments not open to the severely visually impaired. The problem is to develop improved ways to teach these to our children. The list implies a number of narrow highly relevant research and development problems that are open to short term attack.

List four is taken from the report of conclusions of a small group of teachers of the visually impaired who were called together to identify needed mathematics aids and materials. These materials development projects are quite relevant and limited in scope enough to make them suitable research projects for people in our field.

The point I am trying to make hopefully will come into focus when I point out that most all these problems are currently part of programmatic research interests within the city of Louisville, Kentucky. Very real possibilities for both faculty and student research exist in relating to such programs as participants or in assumming responsibility for small parts of such programs. This is yet another way to provide more faculty and student research.

In this rather rambling presentation I have taken at face value the concept that we expect our graduate students to become researchers, that attainment of this concept is probably seriously impaired by lack of opportunity for early research involvement, and how this lack might be alleviated.

I would like to throw this meeting open to discussion at this time by posing the following two questions:

1. Are we really serious when we say we are training our graduates to be researchers?
2. If yes, how can we provide in our graduate opportunities for research experience which will facilitate reaching this goal?

Reference

Switzer, M. E. & Bledsoe, C. W. U. S. Government sponsored research to study blindness - 1970 supplement. Blindness 1970 - AAWB Annual, Washington, D. C., American Association of Workers for the Blind, 1970, pp 159-245.

List Four: Materials Needed to Facilitate Mathematics Instruction. (Suggested at APH-IMRC Mathematics Institute - April 9-11, 1970).

Introductory Materials

1. Kit to introduce the concepts of linear, cubic, and thermal measurement.

2. Numberline with two slides, desk size, with zero at the center.

3. Place value device for counting and comparison of numbers.

Intermediate Materials

1. Simple device for teaching fractional and decimal equivalents.

2. Improved devices for linear measurement including a yardstick, meter stick, and tape measure.

3. Improved graph board with principal axes clearly defined, four quadrants clearly indicated, and positive and negative axes easily discernible.

4. Improved raised line drawing kit.

Advanced Materials

1. Coordinate three dimensional aid to illustrate intersection of lines and planes in space.

2. Pythagorean Theorem Kit using 30-60-90 degree triangles of various sizes.

3. Slide rule for both braille and large type

4. Usable protractor and compass